

## Claims

What is claimed is:

1. A data collection device (10) for reading a machine readable data storage medium (38) comprising data encoded in a readable format, the data collection device (10) comprising:
  - a) a medium reading system (21) for detecting a characteristic of the machine readable data storage medium (38) and generating digital data representative of the characteristic;
  - b) a processor (20) operating an embedded decoder system (76) comprising a decoder module (72) and an interpreter module (84);
    - i) the decoder module (76) receiving the digital data, determining the data encoded in the machine readable data storage medium, and generating decoded data (134); and
    - ii) the interpreter module (84) receiving the decoded data (134) and manipulating the decoded data (134) in accordance with the plurality of data manipulation commands defined in a rules file (85) to generate formatted data (136).
2. The data collection device of claim 1, further comprising a communication module (26) coupled to the processor and transferring the formatted data to a remote system.
3. The data collection device of claim 1 wherein:
  - the interpreter module 84 comprises an expression library (83), the expression library (83) including a plurality of data manipulation commands and, in association with each of the plurality of data manipulation commands, an instruction for performing the data manipulation command (89); and
  - the interpreter module (84) provides for manipulating the decoded data (134) by, for each data manipulation defined in the rules file (85), performing the instruction (91)

8 associated with the data manipulation.

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1 4. The data collection device of claim 3, wherein:

2 the instruction associated with each data manipulation is a compiling instruction  
3 for building executable code for performing the data manipulation;

4 the interpreter module (84) comprises a compiler module (128), wherein the  
5 compiler module (128) uses the compiling instruction to compile a data handling  
6 module (86) for manipulating the decoded data in accordance with the plurality of data  
7 manipulation commands defined in the rules file;

8 and the interpreter module (84) manipulates the decoded data (134) by  
9 operating the data handling module (86).

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1 5. The data collection device of claim 4, wherein the rules file is a script file and the  
2 plurality of data manipulation commands are defined utilizing text commands and  
3 arguments within a programming language recognized by the compiler module (128).

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1 6. The data collection device of claim 5, wherein the plurality of data manipulation  
2 commands (87) included in the expression library (83) defines the universe of data  
3 manipulation commands available for use in the rules file (85).

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1 7. The data collection device of claim 3, wherein:

2 the instruction associated with each data manipulation command (89) is a  
3 compiling instruction for compiling machine readable instructions which are  
4 recognizable by a data handling module (86);

5 the interpreter module (84) comprises a compiler module (128), wherein the  
6 compiler module uses the compiling instruction to compile machine readable  
7 instructions which instruct the data handling module (86) to manipulate the decoded  
8 data in accordance with the plurality of data manipulation commands defined in the  
9 rules file;

the executable code block (86) manipulates the decoded data (134) by retrieving the machine readable instructions and performing the data manipulations in accordance to the machine readable instructions.

8. The data collection device of claim 7, wherein the rules file is a script file and the plurality of data manipulation commands are defined utilizing text commands and arguments within a programming language recognized by the compiler module (128).

9. The data collection device of claim 8, wherein the plurality of data manipulation commands (87) included in the expression library (83) defines the universe of data manipulation commands available for use in the rules file (85).

10. A data collection device (10) for reading a machine readable data storage medium (38) comprising data encoded a readable format, the data collection device (10) comprising:

a) a medium reading system (21) for detecting a characteristic of the machine readable data storage medium and generating digital data representative of the characteristic;

b) a memory comprising instructions executable by a processor, the instructions comprising:

i) a decoder module (76) comprising executable code for receiving the digital data, determining the data encoded in the readable format, and generating decoded data (134); and

ii) an interpreter module (84) comprising executable code for reading a plurality of data manipulation commands from a rules file and manipulating the decoded data (134) in accordance with the plurality of data manipulation commands to generate formatted data (136).

11. The data collection device of claim 10, further comprising a communication

module (26) coupled to the processor and transferring the formatted data (136) to a remote system.

12. The data collection device of claim 10, wherein:

the interpreter module 84 comprises an expression library (83), the expression library (83) including a plurality of data manipulation commands and, in association with each of the plurality of data manipulation commands, an instruction for performing the data manipulation command (89); and

the interpreter module (84) provides for manipulating the decoded data (134) by, for each data manipulation defined in the rules file (85), performing the instruction (91) associated with the data manipulation.

13. The data collection device of claim 12, wherein:

the instruction associated with each data manipulation is a compiling instruction for building executable code for performing the data manipulation;

the interpreter module (84) comprises a compiler module (128), wherein the compiler module (128) uses the compiling instructions to compile a data handling module (86) for manipulating the decoded data in accordance with the plurality of data manipulation commands defined in the rules file (85);

and the interpreter module (84) manipulates the decoded data (134) by operating the data handling module (86).

14. The data collection device of claim 13, wherein the rules file is a script file and the plurality of data manipulation commands are defined utilizing text commands and arguments within a programming language recognized by the compiler module (128).

15. The data collection device of claim 14, wherein the plurality of data manipulation commands (87) included in the expression library (83) defines the universe of data manipulation commands available for use in the rules file (85).

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1 16. The data collection device of claim 12, wherein:

2 the instruction associated with each data manipulation command (89) is a  
3 compiling instruction for compiling machine readable instructions which are  
4 recognizable by a data handling module (86);

5 the interpreter module (84) comprises a compiler module (128), wherein the  
6 compiler module uses the compiling instruction to compile machine readable  
7 instructions which instruct the data handling module (86) to manipulate the decoded  
8 data in accordance with the plurality of data manipulation commands defined in the  
9 rules file; and

10 the executable code block (86) manipulates the decoded data (134) by retrieving  
11 the machine readable instructions and performing the data manipulations in accordance  
12 to the machine readable instructions.

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1 17. The data collection device of claim 16, wherein the rules file is a script file and  
2 the plurality of data manipulation commands are defined utilizing text commands and  
3 arguments within a programming language recognized by the compiler module (128).

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1 18. The data collection device of claim 17, wherein the plurality of data manipulation  
2 commands (87) included in the expression library (83) defines the universe of data  
3 manipulation commands available for use in the rules file (85).

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1 19. A method for decoding a machine readable data storage medium comprising  
2 data encoded in a machine readable format and manipulating the decoded data for  
3 output by a data collection device, the method comprising:

4 a) detecting the data encoded in the machine readable format and  
5 generating digital data representative thereof;

6 b) passing the digital data to an embedded decoder system which:

7 i) determines the data encoded in the data elements and generating

8 decoded data; and

9 ii) manipulating the decoded data in accordance with the plurality of  
10 data manipulation commands defined in a rules file to generate formatted data.

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1 20. The method of claim 19, further comprising transferring the formatted data to a  
2 remote system.

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1 21. The method of claim 19, wherein:  
2 the step of manipulating the decoded data comprises, for each data  
3 manipulation command defined in the rules file:  
4 obtaining from an expression library an instruction associated with the  
5 data manipulation command; and  
6 performing the instruction.

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1 22. The method of claim 20, wherein:  
2 the instruction associated with each data manipulation command is a compiling  
3 instruction for building executable code for performing the data manipulation;  
4 the step of manipulating the decoded data comprises:  
5 using the compiling instruction to compile a data handling module for  
6 manipulating the decoded data in accordance with the plurality of data manipulation  
7 commands defined in the rules file; and  
8 manipulating the decoded data by operating the data handling module.

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1 23. The method of claim 22, wherein the rules file is a script file and the plurality of  
2 data manipulation commands are defined utilizing text commands and arguments within  
3 a pre-defined programming language.

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1 24. The method of claim 23, wherein the plurality of data manipulation commands  
2 included in the expression library defines the universe of data manipulation commands

available for use in the rules file.

25. The method of claim 20, wherein:

the instruction associated with each data manipulation command is a compiling instruction for compiling machine readable instructions which are recognizable by a data handling module;

the step of manipulating the decoded data comprises:

using the compiling instruction to compile machine readable instructions which instruct the data handling module to manipulate the decoded data in accordance with the plurality of data manipulation commands defined in the rules file; and manipulating the decoded data by operating the data handling module to retrieve the machine readable instructions and perform the data manipulations in accordance to the machine readable instructions.

26. The method of claim 25, wherein the rules file is a script file and the plurality of data manipulation commands are defined utilizing text commands and arguments within a programming language recognized by the compiler module.

27. The method of claim 26, wherein the plurality of data manipulation commands included in the expression library defines the universe of data manipulation commands available for use in the rules file.

28. A method for decoding a machine readable data storage medium comprising data encoded in a machine readable format and manipulating the decoded data for output by a data collection device, the method comprising:

- a) detecting the data encoded in a machine readable format from a machine readable data storage medium (38) and generating digital data representative thereof;
- b) passing the digital data representative of the code elements to a memory;
- c) executing from the memory, native machine code instructions comprising:

8                   i) decoder instructions for retrieving the digital data, determining the data  
9 encoded in the data elements, and generating decoded data; and

10                   ii) interpreter instructions for reading a plurality of data manipulation  
11 commands from a rules file and manipulating the decoded data in accordance with the  
12 plurality of data manipulation commands to generate formatted data.

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1   29.    The method of claim 28, further comprising transferring the formatted data to a  
2 remote system.

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1   30.    The method of claim 28, wherein:

2           the step of manipulating the decoded data comprises, for each data  
3 manipulation command defined in the rules file:

4                   obtaining from an expression library an instruction associated with the  
5 data manipulation command; and  
6                   performing the instruction.

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1   31.    The data collection device of claim 30, wherein:

2           the instruction associated with each data manipulation is a compiling instruction  
3 for building executable code for performing the data manipulation;

4           the step of manipulating the decoded data comprises:

5                   using the compiling instruction to compile a data handling module for  
6 manipulating the decoded data in accordance with the plurality of data manipulation  
7 commands defined in the rules file;

8                   manipulating the decoded data by operating the data handling module.

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1   32.    The method of claim 31, wherein the rules file is a script file and the plurality of  
2 data manipulation commands are defined utilizing text commands and arguments within  
3 a programming language recognized by the compiler module (128).

1 33. The method of claim 32, wherein the plurality of data manipulation commands  
2 (87) included in the expression library (83) defines the universe of data manipulation  
3 commands available for use in the rules file (85).  
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1 34. The method of claim 30, wherein:

2 the instruction associated with each data manipulation command is a compiling  
3 instruction for compiling machine readable instructions which are recognizable by a  
4 data handling module;

5 the step of manipulating the decoded data comprises:

6 using the compiling instruction to compile machine readable instructions  
7 which instruct the data handling module to manipulate the decoded data in accordance  
8 with the plurality of data manipulation commands defined in the rules file; and

9 manipulating the decoded data by operating the data handling module to  
10 retrieve the machine readable instructions and perform the data manipulations in  
11 accordance to the machine readable instructions.  
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1 35. The method of claim 34, wherein the rules file is a script file and the plurality of  
2 data manipulation commands are defined utilizing text commands and arguments within  
3 a programming language recognized by the compiler module (128).  
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1 36. The method of claim 35, wherein the plurality of data manipulation commands  
2 (87) included in the expression library (83) defines the universe of data manipulation  
3 commands available for use in the rules file (85).  
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